

Claims

- [c1] 1.A method for identifying the presence and delineation of embryonic stem cells in a cell sample, the method comprising the step detecting the presence of cells within the cell sample expressing s-SHIP RNA.
- [c2] 2.The method of claim 1 wherein the presence of embryonic stem cells in the sample is indicated by the presence of s-SHIP enzymatic activity.
- [c3] 3.A method for identifying the presence and delineation of embryonic stem cells in a cell sample comprising a mixture of cells, the method comprising the steps of: adding anti-ship monoclonal antibody P2C6 or P1C1 to the sample under conditions, and for a time, suitable for antibody binding; and detecting the presence of the antibodies bound to the cells in the sample, wherein the presence of embryonic stem cells in the sample is indicated by cells that express the s-SHIP isoform.
- [c4] 4.A method of claim 3, wherein the antibodies are labeled with a flouochrome.
- [c5] 5.A method according to claim 4, wherein the detection is by fluorescence activated cell sorting.

- [c6] 6.A method for identifying the presence and delineation of hematopoietic stem cells cell sample, the method comprising the step detecting the presence of cells within the cell sample expressing s-SHIP RNA.
- [c7] 7.The method of claim 5 wherein the presence of hematopoietic stem cells, or other tissue-specific stem cells, in the sample is indicated by the presence of s-SHIP enzymatic activity.
- [c8] 8.A method for identifying the presence and delineation of hematopoietic stem cells in a cell sample comprising a mixture of cells, the method comprising the steps of: adding anti-ship monoclonal antibody P2C6 to the sample under conditions, and for a time, suitable for anti-body binding; and detecting the presence of the antibodies bound to the cells in the sample wherein the presence of hematopoietic stem cells in the sample is indicated by cells that express that express the s-SHIP isoform.
- [c9] 9.A method of claim 8, wherein the antibodies are labeled with a flourochrome.
- [c10] 10.A method according to claim 9, wherein the detection is by fluorescence activated cell sorting.

- [c11] 11.A method for inhibiting proliferation of stem cells, the method comprising the step of contacting the cells with s-SHIP thereby increasing competition with mSosl for Grb2 in the stem cells.
- [c12] 12.The method of claim 11 wherein the stem cells are selected from a group consisting of hematopoietic progenitors of mature blood cells, hematopoietic progenitors of lymph cells, and embryonic stem progenitor cells.
- [c13] 13.A method of inhibiting differentiation of stem cells comprising the step of contacting the cells with s-SHIP enzyme whereby the accumulation of the s-SHIP enzyme prevents the accumulation of $PI^{3,4,5}P_3$, or other signaling pathways and intermediates influenced by s-SHIP activity.
- [c14] 14.The method of claim 13 wherein the stem cells are selected from a group consisting of hematopoietic progenitors of mature blood cells and hematopoietic progenitors of lymphoid cells.
- [c15] 15.A recombinant nucleic acid promoter fragment isolated from the an internal region of the SHIP genes where s-SHIP transcription is controlled, wherein the promoter fragment comprises a nucleotide fragment internal to the SHIP gene.

- [c16] 16. The recombinant nucleotide promoter fragment of claim 15 wherein the amino acid sequence is selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, and 10.
- [c17] 17. The recombinant nucleotide promoter fragment of claim 15, whereby the fragment is found in stem cells selected from the group consisting of: murine embryonic stem cells, murine hematopoietic stem cells, human embryonic stem cells and human hematopoietic stem cells.
- [c18] 18. A method for inducing proliferation of stem cells, the method comprising the step of introducing anti-SHIP shRNA into the cell by electroporation.
- [c19] 19. The method of claim 18 wherein the stem cells are selected from a group consisting of hematopoietic progenitors of mature blood cells, hematopoietic progenitors of lymph cells, and embryonic stem progenitor cells.
- [c20] 20. A method of identifying stem cells in a cell sample, comprising the step of detecting s-SHIP by immunofluorescence.
- [c21] 21. The method of claim 20 wherein the cell sample is a complex mixture of cells.

- [c22] 22.The method of claim 20 wherein the cell sample is in vivo.
- [c23] 23.The method of claim 20 wherein the presence of stem cells is indicated by the presence of the s-SHIP isoform.
- [c24] 24.A method of inducing proliferation in stem cells comprising the step of introducing an inhibitor of s-SHIP activity.
- [c25] 25.The method of claim 24 wherein the inhibitor of s-SHIP is a dominant negative mutant.
- [c26] 26.The method of claim 24 wherein the stem cells are selected from a group consisting of hematopoietic progenitors of mature blood cells, hematopoietic progenitors of lymph cells, and embryonic stem progenitor cells.
- [c27] 27.The method of claim 24 wherein the stem cells are induced to differentiate.
- [c28] 28.A method of identifying stem cell-specific signaling components comprising the step of contacting the signaling component with s-SHIP.